THE

VETERINARY JOURNAL

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Editorials.

MR. JOHN McKENNA, F.R.C.V.S.

FEW men have devoted more energy, or given up more time to the forward progress of the Veterinary profession than our present President, and none have its well-being more at heart. Born at New Galloway, Kircudbrightshire, in 1864, he graduated, when only 21 years of age, at the Glasgow College, having been a pupil with the late Mr. Thomas Campbell, F.R.C.V.S., of Kircudbright. After acting as assistant for some years in Sheffield, Mr. McKenna decided to settle down in practice in Huddersfield, where his ability as a practitioner and his personal integrity soon gained a large and influential *clientêle*, whose numerous professional calls have made his life a very busy one.

Taking the Fellowship Degree in 1893, he became a Member of Council in 1901, and from that time forward has worked assiduously in forwarding every move which has advanced our welfare.

An energetic practitioner and extremely conscientious worker, Mr. McKenna has particularly at heart those measures which will benefit the student and be likely to fit him to become successful in after life, and his lifelong experience of men and things will be of inestimable value in this direction.

At the present moment, in the transition period from war to peace, the situation is a difficult and tedious one, and many extra problems will have to be solved which have not appeared on other occasions, but the members of the profession may rest assured that they are

in safe and cautious hands, and that during his period of office no trouble will be considered too great, and no effort will be spared to make the successful solution of these problems possible.

THE POSITION OF THE AMERICAN ARMY VETERINARY CORPS.

FOLLOWING so closely upon its new organisation, largely on the model of the British Army Veterinary Corps, it is of importance that the Veterinary Corps in the American Army shall maintain its status and continue to carry on as useful a work during time of peace as it did during the recent great war.

In our columns will be found an article by Major McMurdo, an American veterinary officer of great experience, wherein the matter of control is very ably discussed. It will be of especial interest to those officers who still remain in the regular A.V.C., and by no means without interest to the large numbers of others who have so recently been serving.

At the present moment the American Army Veterinary Corps is placed as a part of the Medical Department, and not, as in our Corps, in the Department of the Quartermaster-General. The suggestions are :—*First*—That it shall be organised and kept as a separate Corps. *Second*—That it be united with the Remount organisation, under a common head, into a new Corps. *Third*—That it become a part of the Quartermaster Corps. *Fourth*—That it remain a part of the Medical Department as at present.

The arguments for and against each and all of these are very clearly and lucidly put, and are well worth careful perusal. They will recall to the minds of some of our older R.A.V.C. officers the days when they had a similar problem to solve.

THE COLONIAL CALL

OUR profession is not distinguished for its perfect organisation. Individualism has its good side, and it is not beneficial to be lacking in enterprise, and all to be on a dead level. But young countries, like young people, possess life, energy, enthusiasm in abundance, and wise parents ought not to ignore the welfare of their offspring. The offspring may afford the power that enables us to get a move on. Cohesion and closer union between the graduates of our colonial colleges and universities and ourselves will be for the benefit of our science and art, and produce a greater driving force for advancement, and getting things done than if each country ploughs its own lonely furrow. In Congresses of future years we and our colonies must fill up the blanks in the advance of science that will inevitably ensue for

years to come through the devastated and dethroned areas of Central Europe.

Our own kingdom for veterinary enterprise is limited, but beyond in Canada, Australia, New Zealand, India, South Africa, the field is vast and largely untenanted and inadequately explored. The future will need men of keen vision and broad mind, and some giants in organisation and administration, if full advantage is to be taken of the land waiting to be cultivated. Our Council never did a wiser thing than when it opened its doors for colonial graduates to take the diploma of the R.C.V.S. Each of the men who qualified may be looked upon as a missionary from the mother country to her glorious children. We sincerely hope that the good work may go on. The children are worthy of all help and support, and they will be staunch and true to the motherland. In *savoir faire*, *bonhomie* and business tact we can teach them nothing ; in technical skill and science, as applied in this country, they are well equipped, and have little to learn. It will be all to the advantage of veterinary science, art, and business to confer with them often, to listen to their views, to receive them with open arms, to help and encourage them all we can. Unity of request and demand as far as may be, and where it coincides as regards the mother country and the colonies, will come with the greater force to politicians, statesmen and Governments than from isolated, disintegrated, and spasmodic efforts to improve the scope of our domain and the status of our members.

Quite recently a colonial graduate who took his M.R.C.V.S. degree at the last examination of the R.C.V.S. wrote us as follows : " I firmly believe that one of the best ways to tighten the bonds between the Colonies and the Mother Country would be by the instituting of an Imperial Conference that would meet periodically, say, in London, and at which veterinary representatives of each of the Colonies may be privileged to attend and confer with representatives of the United Kingdom on matters veterinary affecting the interests of the Empire." The modern view is well put in the above quotation—it needs sympathetic consideration and support from us. The Empire view of veterinary matters is too little discussed and considered. If it is to fructify and develop on the best lines, and if we are to prove ourselves a virile, wide-awake and up-to-date band of professional men, we must give it earnest consideration and support in the times to come. Although a small body, let us show to the world that we are not lacking in grit, stamina, intellect, and united effort and far-sightedness in the interests of the welfare of our country and Empire.

G.M.

ANIMAL DENTISTRY.

It has been said that the teeth of mankind are nothing but a trouble from the cradle to the grave. That they are apt to decay, we all know. Dentists tell us that the teeth of men and women get worse from generation to generation, and as time goes on, scientists argue that we shall be more or less a toothless race. There is much about the decay of teeth that needs further explanation. Caries cannot be altogether due to the action of injurious micro-organisms on the dental tissues. Food, water, and heredity must play a part in the process. How is it that occasionally, in a town or district noted for the early decay of teeth, we come across individuals with perfect natural dental armoury, which lasts far into a good old age? Carnivora in their natural state are very, very rarely troubled with tooth-ache, and in almost every case the beautiful white aspect of their teeth is one of their marked features. The horse is perhaps the animal we are most often called upon to remedy dental defects in, unless we except the smaller breeds of house dogs such as Yorkshire terriers, Schipperkes, pugs, Pekinese, etc. It is perhaps a reflection on us that since the invention of the Santy and Wells forceps, somewhere about 1865, little scientific attention appears to have been given by the profession to the matter of dentistry. Rule of thumb rasping of the teeth at half a crown a time has gone on merrily from generation to generation. The public has been satisfied with it, but then the public is not given much to thinking, and the veterinary surgeon is fearful of making an enemy for life if he upsets the hoary half-crown tradition, or else the thought of "Why consider the matter more closely when the reward is so small?" enters his mind. We generally work in the dark in a horse's mouth, and oral operations are only roughly and imperfectly carried out. It is rather remarkable that a great number of equine patients do eat better after having the teeth rasped, but this may be due to the frequent giving of an alterative ball at the same time as the rasping takes place.

We have wondered for some time why some of our graduates, and especially the younger ones, have not devoted some of their time to study and experimentation with local anæsthetics in animal dentistry. Novocain has given excellent results in extractions in human beings, and some such anæsthetic might be beneficially and effectively employed in equine dentistry. Bearing on this matter, we recently came across an article in the *American Journal of Veterinary Medicine* for January, 1918, on "The Extraction of Molar Teeth of Horses," by Major L. A. Merillat, V.C.N.A. In this he writes: "To control the pain of extractions, we very highly recommend Bemis nerve-

blocking operation. For this purpose we use a 2 per cent. solution of cocaine hydrochloride injected with a long hypodermic needle into the region of the maxillary hyatus for maxillary molars, and into the region of the mandibular foramen for mandibular molars." The objections to extracting molars (especially where two or three have to be dealt with) in the horse or ox, with the patient under a general anæsthetic, are real and evident, and yet under the Amended Animals (Anæsthetics) Bill we are compelled to use a general anæsthetic. It does seem to us that this matter required further thought and consideration before scheduling, and with the mouth well open with a modern mouth gag, and effectively controlled, and a good light into it, full advantage might be made of the use of local anæsthetics, and a very thorough examination. Personally, we have had more trouble in remedying dental defects in cattle than horses. Not because the teeth are harder to extract, but on account of the difficulty in keeping the gag and the cow's head steady, getting the mouth well open, and combating the wider lateral play of the jaws. For cutting off overgrown molars there has been some thought devoted to the matter, and really *modern* tooth shears can now be obtained from the instrument makers. We wonder how many of the Veterinary Associations possess them? The old top-heavy shears were fairly effective, but they needed a man of brawn and muscle to operate them, and always reminded us of the use of a steam hammer to crack a filbert nut.

Dental instruments for animals are pretty expensive. They are not in regular use. They need to be constantly looked over and carefully cleansed and kept. The aseptic instrument is quite as important in animal dentistry as in the human case. These are reasons why it is better to have a full and duplicate or triplicate stock the property of an association, and promptly at the service of its members, rather than individual ownership. Mouth-gags are various and pretty effective. We pay a tribute of praise to Malloch's. It is handy, and though it does not open the mouth wide enough for extractions, it is quite a good one for ordinary examination and rasping of the molars. Young horses do not resent its insertion and presence in the mouth, and it can be slipped in the pocket and easily taken with us when examining horses for soundness away from home.

In canine dental practice veterinary surgeons have made fairly up-to-date advance. The man who first introduced the scaling of dogs' teeth deserves the blessing of the profession. It pleases the ladies, and *après cela qu'importe?* The best of it is, it pleases those who in the present day have perhaps the most money to spare. In canine dental practice the use of local anæsthetics has also to a large

extent been overlooked. Possibly because it is too much trouble. Ethyl chloride, novocain, eucaine, etc., are all handy, and *divinum opus est sedare dolorum.*

Our education is never completed; we can always learn something. More earnest thought needs to be given to the subject of animal dentistry. If we do not advance with the times, our science will become primitive and our art lost.

G. M.

Original Communications.

MILK FEVER WITH HYPER-PYREXIA-THROMBOSIS.

By F. T. HARVEY F.R.C.V.S.,
(*St. Columb.*)

History.—The cow had had several calves. She was of a Guernsey cross, and very fat, having been dry for a long time. She was a rich milker. She calved the previous afternoon, and the membranes were passed at the fifth hour. During the evening the cow was noticed to drink very slowly, but she fed, and was not considered to be out of sorts. She calved in the open, and remained out during the night. The following morning she was on her side and helpless. The breathing was heavy.

Mr. Fourie, M.R.C.V.S., saw the cow at 9.30 a.m. The jaws were fixed as in tetanus, temperature 105° F. The udder received the usual air treatment. We both visited the patient at 11.30 a.m. The temperature was now 108° F. Her state was desperate, and she seemed likely to die at any moment; her jaws were tightly clenched, and the body generally in a state of convulsion, the muscles of the orbits being especially involved. A condition of asphyxia seemed rapidly supervening, and there was a large collection of foam round the nostrils. There was no tympany, but it was impossible to get the cow into the sternal position. Quite unconscious, she presented a sorry appearance.

Treatment.—One ounce of chloral hydrate was passed into the rumen through a cannula, and the surface of the body was well douched with cold water. The patient was then turned over and the cold bathing continued. In one hour the temperature came down to 104° F., and the whole aspect of the case had changed. The trismus had disappeared, and the cow drank some water; she could now be kept up in a good position, and the breathing was quietening down. The uterus was not septic. At 7.30 p.m. the temperature was barely 100° F. The cow was drowsy, but comfortable, the kidneys and bowels were acting tardily. She drank water, but took no food. A hypo-

dermic of strychnine was given and some laxitive salines added to the drinking water. Second day, 10 a.m. Since 8 a.m. the cow had gradually become quite comatose (milk fever relapse). No temperature. The udder was again injected with air. Heart stimulants were given hypodermically. During the day the excretory organs began to respond, the head cleared, and the patient showed an inclination for food.

The progress of the case during the next few days was not quite satisfactory. After the third day she fed well, was fairly comfortable, and her appearance was good, but she remained on the ground helpless. The cow was slaughtered on the sixth day, and made an excellent carcase of meat. The owner, a retired butcher, reported that the only change in any of the tissues which he would regard as abnormal when the carcase was dressed, was the presence of clotted blood in some of the small veins in the sub-lumbar region.

Remarks.—The case is interesting from several points of view. So high a temperature is quite unusual in milk-fever, and it once more illustrates the very wide range of clinical phenomena one may meet with in a series of cases of the disease. The effect of cold water in lowering the body heat was particularly pleasing, it acted like magic. The presence of blood clot in some of the veins in the region of the loins is very suggestive, as such a condition (venous thrombosis) occurring in connection with the spinal meninges might explain the continuation of the paraplegic state. Plugging of the large veins is probably the cause of the state of gangrene found in the limbs in some instances, and pulmonary embolism is not an improbable cause of some of the cases of sudden death sometimes noted in cows which have apparently quite recovered from an attack of milk-fever.

A favourite theory of the older practitioners regarded milk-fever as being essentially of the nature of apoplexy. It would seem that ante-mortem clotting of the blood does actually occur in the veins in some fulminating cases of the disease, and that to some such change is due the failure of an animal to pull through after a very promising rally, or response, to the usual treatment.

The older men saw nearly all their cases end fatally, and in making post-mortems they noted appearances which suggested the apoplectic state, and accordingly called the disease parturient apoplexy. The moderns see most cows well after a comparatively brief illness, and argue that the disease cannot be apoplexy at all. Much may be said for both views, and one might divide cases of milk-fever into two classes, viz., those in which a minimum of histological disturbance occurs in the body, and those in which there is gross anatomical

change, or in other words, the cases which recover readily, and those which do not.

Everything will depend on the stage in which the disturbing element —whatever its cause or nature may be—comes under control. If this control or correction of disturbance does not happen, there follows anatomical change, and this, in some peracute cases, seems to occur quite early in the attack. For a solution of the problem of the real cause of milk-fever we must, I think, look to the endocrinologists and bio-chemists of the future. That it is intimately associated with some hitherto unexplained endocrine function of the mammary gland seems to me highly probable.

The remarkable development in modern times of the milk glands in certain cows is a marvellous phase in biology. It is impossible to over-estimate the importance of Schmidt's discovery in the evolution of the modern cow. It stands out as a landmark in the history of the dairy industry. The survival of the best cows as breeders enables the continuation of milking strains which in many instances would have been lost.

Will the cow of the future so perfect her own mechanism as to become more or less immune from the disease ?

The feat of a cow giving 2,000 gallons of milk at one lactation can, I think, only be regarded as an example of functional giantism. It in all probability involves the pressure of an enzyme or catalyst or hormone in the blood-stream of the animal, and one having an action somewhat similar to that which *secretin* has when absorbed on the activities of the pancreas.

While the above thoughts were passing through my mind, I saw in *The Stockbreeder* an account of a cow named " Veracity " having given 51,000 lbs. of milk in five years, and the following sentence there occurred : " It is now definitely known by dairy shorthorn experts that were such cows as ' Veracity ' to be rested for a year or two, and then artificially fed and ' forced,' she would easily yield 2,000 gallons at one lactation." Here we have a long rest and inaction resulting not in diminished working power, but in increase of capacity. The case is comparable to the internal combustion engine, which on being given a supply of petrol and current, starts away at full speed after a long rest. It is known that the cow does store in her system the fat soluble Vitamine and goes on yielding it up with the milk until her store is exhausted, but she can obtain this substance only from the vegetable kingdom ; she does not form it, but merely hands it on. On the other hand, a hypothetical milk-forming hormone must be formed and stored in her own body.

XUM

Professor Arthur Keith (1) has recently developed the *Theory of Hormones* in order to explain the development of racial types in man, and giantism and dwarfism as applied to individuals.

He says : " Secretin is a hormone which effects its errand rapidly and immediately, whereas the growth or morphogenetic hormones thrown into the circulation by the pituitary, pineal, thyroid, suprarenal and genital glands act slowly and remotely. But both are alike in this : The result depends not only on the nature of the hormone or missive, but also on the local recipient. The local recipient may be specially greedy, as it were, and seize more than a fair share of the manna in circulation, or it may have ' sticky fingers ' and seize what is not intended for local consumption." Is it possible that the cells of the mammary gland of the cow may also become affected with " sticky fingers," and in error elaborate some substance not intended for local consumption, and which, gaining access to the blood stream, produces a condition of intoxication which we recognise as milk fever ?

Keith further suggests the probability of the existence of many other mechanisms regulated by hormone with which we are as yet totally unacquainted.

" At the beginning of a great mammary effort the pre-renal glands are set going by messages passing to them from the central nervous system ; they throw a hormone—adrenalin—into the circulating blood which has a double effect ; adrenalin acts on the flood-gates of the circulation so that the major part of the blood passes to the mammary glands. At the same time it so acts on the liver that the blood circulating through that great organ becomes laden with blood-sugar."

With such a mechanism in action, it does not require much imagination to picture the cow with her highly-specialised milk-forming apparatus experiencing disaster when something goes wrong with the machine as focussed in the udder. The correction of the disturbance by means of elastic pressure on the tissues of the gland is suggestive. The amount of blood circulating through the organ is reduced or stabilised, the working cells are flattened out also by the same pressure, and thus thrown into a resting state for a time, and the general toxic condition of the cow disappears. The cells having had " their week-end," so to speak, again begin the manufacture of milk under appropriate stimulation. If their metabolism is normal, the

REFERENCE.

(1) Presidential address on "The Differentiation of Mankind into Racial Types."
British Association for the Advancement of Science, 1919. Anthropological Section.

cow continues well, but, on the other hand, if it is irregular or erratic, toxin again finds its way into the blood-stream, and the cow is again poisoned, milk-fever relapse.

AN INTERESTING CRYPTORCHID.

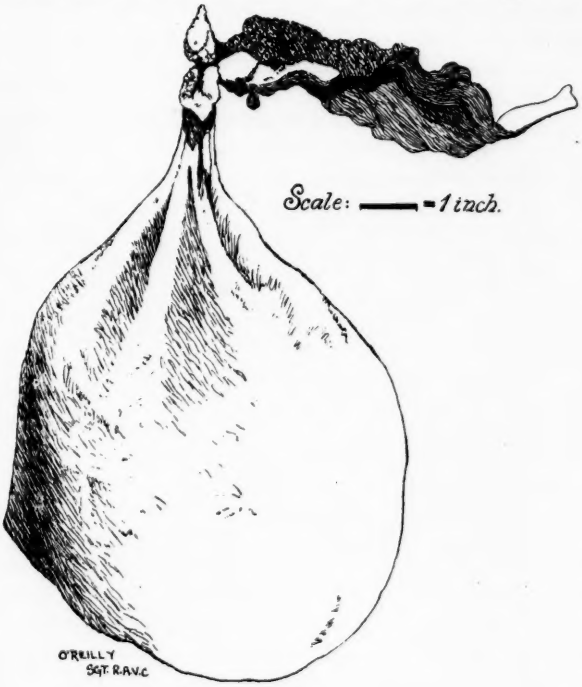
By FREDERICK HOBDAY, F.R.C.V.S:
London.

THE subject, a two-year-old shire colt, was purchased as a cryptorchid, and had begun to be very troublesome. The owner, therefore, decided upon operation, and this was done on the 8th of October, in consultation with Mr. Gerald Watkins, M.R.C.V.S., under chloroform, the patient being cast and secured in the usual way. Upon examination a scar was detected on the right side of the scrotum, and as exploration of the left inguinal canal discovered no evidence of the missing testis, the abdomen was entered. Here the missing cord was picked up and could be traced to pass through the coils of intestine, and when pulled upon it appeared to have a resilient body at its extremity, but this was so far away that it could not be reached, and its size prevented it from being pulled within reach. Failing in this, a large loop of cord was withdrawn and severed through with the écraseur, the floating body falling back into the abdomen. The inguinal canal was sutured, and for two days all apparently went well, but on the fourth day the animal was found dead in the box. *Post-mortem* examination revealed the cause of death to be a septic infection originating from the wound and spreading along the muscles of the thigh and the exterior of the abdomen. There was no visible peritonitis, and the missing testicle was lying loose in the abdominal cavity. The cord itself, including the portion excised, measured 13 ins., and the specimen (which was sent to Sir John Bland Sutton, F.R.C.S.), was like a child's toy balloon.

The undermentioned is this distinguished pathologist's description of it :—

> " The cyst is of the same shape, and as big, as a Rugby football. It contains a single chamber, filled with chocolate-coloured fluid. There are scars of ruptured loculi on the inner wall, indicating that originally the cyst was multilocular. A nodule of bone and soft tissue is attached to the inner wall by a narrow base, otherwise the inner wall is smooth. The outer wall of the cyst is covered by a loose capsule. On microscopical examination I found the testicular tissue quite outside the large cyst, so that it agrees with the dermoids, and is extra-testicular. The pedicle contains the usual arteries and plexus of veins."

It is interesting to note that in the entire absence of testicular tissue the sexual propensity of the colt still persisted, as the owner



of the animal stated that it had become a danger to other animals and a perfect nuisance.

SOME INTERESTING CRYPTORCHID CASES.

By Major W. J. Ascott, M.R.C.V.S.,
Bideford.

Enclosed are two photos of the testicles of two "rigs" which may be of some interest to those who wish to practice the operation. No. 1 interested me at the time—nearly twelve years ago—very much, and I learnt a sharp lesson (at the expense of my client, some will say) from my blunders, and although I was not then, nor am I now, at all proud of the operation, I send the notes of it along so that possibly someone else may profit by them.

Subject.—A half-bred five-year old of the 'bus horse type, the property of a small dealer, for whom I had previously operated on three cases successfully, and who had bought him cheap because of

his rig propensities. The owner thought he had bought an easy subject, as he was positive he could feel both "stones," and on examining him standing, I thought so, too; at any rate, I thought the right one would be quite easy as it could be grasped outside the canal, but the left one was in the canal, not so loose, and therefore perhaps more trouble. I operated on the left side first, but soon found the object was not the testicle, but a large inguinal gland. I had gone so

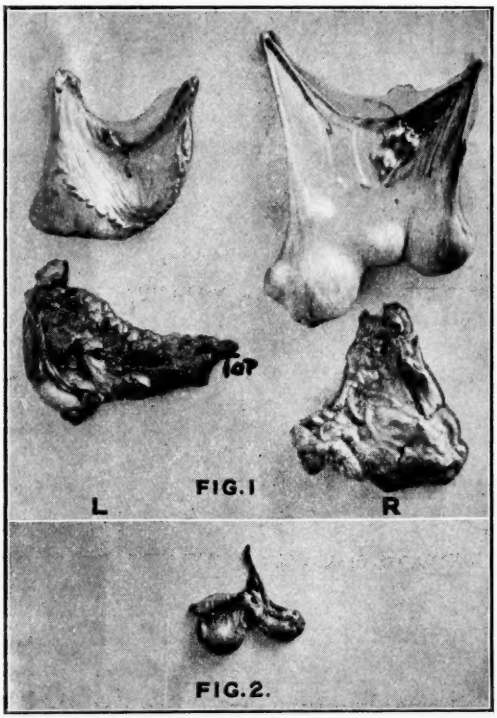


FIG. 1.—SHOWING THE TESTICLES AND ALSO THE TWO INGUINAL GLANDS.
FIG. 2.—AN ABNORMALLY SMALL ABDOMINAL TESTICLE.

far, however, before discovering my mistake that I thought it best to complete its removal, and then proceeded in the usual manner to enter the abdomen where I soon found the missing organs. I then, quite heedless of my previous lesson, removed what we both thought to be a testicle, but found to my chagrin and disgust it was also an abnormal gland. There was nothing for it but to carry on, and I was rewarded with the good specimen shown. Fortunately the patient did very

well and made a good recovery, but I repeat I was not at all proud of my blunders. The lower left gland in the photo should have been turned half-left for photographing, *i.e.*, it should have been fixed in the same position as the right. Both were pedunculated, and the right one was quite loose to handle. The second photo is only interesting because of its size. It could have easily been contained in a walnut shell, and yet although so miniature, was a perfect specimen. I was pleased with this case, as it was one of my early cases, and the first I had found by following the guides given by Professor Hobday in his little work on the subject. I found it near the neck of the bladder. It is also easily the smallest I have so far found in over 150 cases.

INTESTINAL ABNORMALITIES IN A MARE.

By J. B. TUTT, F.R.C.V.S., and J. F. D. TUTT, M.R.C.V.S., F.R.M.S., F.Z.S.
Winchester.

ALTHOUGH it is not at all uncommon on post-mortem examination to find now and again some anatomical deviation from the normal, the conditions which we found at a recent post-mortem examination seem so very exceptional that we feel bound to record them.

Subject.—The subject was a valuable in-foal shire mare (served in May), seven years of age.

Previous History.—The mare slipped her foal last year. Beyond this she had never had a day's illness. This was easily verified, as the owner bred her himself.

Clinical History.—On the night of November 25th, one of us (J.F.D.T.), in response to a telephone message, visited the patient.

The mare was uneasy at intervals, pawing the ground, looking round at herself, and going down with a slight tendency to roll. Temperature, pulse, respirations were normal and it may here be noted that this was constant through the whole period of illness. As she was in foal, two mild stimulant balls of Carbonate of Ammonia were given, and a quarter of a grain of Atropine Sulphate hypodermically.

Ether Meth. ℥ss. and Camphor ʒii. were given every four hours in a pint of cold water.

She was seen again at 9 the next morning, and appeared the same, but as no defæcation had taken place, a grain of Pilocarpine was given hypodermically. Slight defæcation followed in about an hour. At 6 p.m. she was again uneasy, and went down when the colicky spasms came on (once or twice an hour), and was inclined to roll. We then gave two grains of Pilocarpinæ, with exactly similar results, and discontinued the Ether, and substituted for it ℥ss. doses

of Chlorodyne (Hewlett), combined with fl32 Aether Hyponit. every four hours in a pint of water.

She continued like this for the next few days.

As the mucous membranes were somewhat icteric, one of us (J.B.T.) prescribed Glaubers Salts in ʒ2. doses morning and night in the drinking water.

Between the fifth and sixth day the mare had diarrhœa, which became very watery in consistency.

A carminative mixture containing Tinct. Card. Co., Sodii Bicarb. and Ess. Menth. Pip. was then given.

On the eighth day there was a distinct improvement, and the mare appeared to be on the way to recovery.

On the ninth day she dropped dead in the box.

Post-mortem Examination.—The Ileum was found to open direct into the Colon. It had no communication with the Cæcum.

At its junction with the Colon (and situated at the " apex " of the Colon) there was a dilated mass of bowel, resembling a dilated stomach. with a capacity of two and a half gallons. Inferiorly this mass of bowel was loosely attached to the interior of the Colon by fascia-like tissue, and was easily separated from it, but superiorly it was directly continuous with the Colon and Cæcum.

It had a communication with the Ileum, but smaller than that of the Colon, and had a large communication with the Cæcum (large enough to comfortably accommodate an average human arm), and a third small, rather restricted, communication with the Colon.

The Cæcum was connected to the Colon throughout its extent by a solid mass of Muscular Tissue (half an inch thick, and over two feet in length). There was absolutely no trace of the usual connecting Peritoneum.

The Colon was ruptured about three inches below the Ileum opening. The Mesenteric lymphatic glands were very congested and enlarged, and stood out like two solid cords on each side of the muscular mass already referred to as connecting the Cæcum to the Colon. The Cæcum was full of fæcal matter, the dilated mass of bowel was literally packed with solid fæces. The Colon, on the other hand, was empty.

POST-PHARYNGEAL SURGERY.

By R. JONES, M.R.C.V.S.
(*Towyn*).

CASE 1.—A three-year-old bullock which had been early in the winter suffering from actinomycosis of the back of the tongue and throat. The affected parts were painted with Tint. Iod. and Pot. Iodide given internally. I ceased to attend, and he was reported to

have apparently recovered. In the spring he was turned out with the rest of the bunch, and in the course of some weeks the bailiff reported that the same bullock was exceedingly bad, constantly coughing and making a distressing noise during respiration ; practically unable to graze, and that he would be taking him up from grass past my premises at a certain hour. I examined his throat and could see a tumour at the back of the pharynx, hanging in front of the larynx, the symptoms as described by the bailiff, and the bullock fallen off in condition.

I arranged to go the following morning to destroy him if unable to remove the tumour with a view to ultimate recovery.

In the struggle and exertion of being thrown, he became exhausted before I completed the tying, and had I not hurriedly opened into his trachea, he would have suffocated. He immediately recovered himself when the breathing was relieved. A tracheotomy tube was inserted and I placed a mouth gag and examined the throat. I found a mush-room-shaped tumour attached with a pedicle about 1¼ inches to the posterior surface of the pharynx. I tried to tear through the pedicle with my fingers, but failed. Without much difficulty I got the ecraseur chain round the pedicle close to the mucous surface, and removed the growth. I did not see the case afterwards, but my daughter called daily to dress the tracheotomy wound, which was soiled by a little food escaping. Nothing further was done to the throat, and the animal was fed on mashes and a little grass for some days. He made a complete recovery and was sold with the rest.

Case 2.—I was asked to see an incalf heifer which was making a noise in breathing. I found the heifer as described, and proceeded to examine her throat. It proved an extremely difficult matter to make anything like a thorough examination of her, and I decided to let her calve before doing anything further, as she was able to graze fairly well.

A few days after she had calved, I was informed that the condition of the throat was such that the breathing was very distressing, and the heifer unable to take any nourishment. From what I could see and feel in the throat when making my first examination, I suspected an abscess on the superior surface of the pharynx. I had her taken out of the building to a field close by, never suspecting that the difficulty in breathing was such that there would be any danger of suffocation in the struggle of throwing. It was proved that I was wrong in my conjecture, for I had to hurriedly open the wind pipe in this case also, and insert a tube.

When the gag was placed in her mouth, I made a manual examination of the throat and found the superior surface of the pharynx much swollen, thereby interfering with the breathing and deglutition.

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With some force I pressed my fingers through and made a forward tear in the membrane. This was followed by a gush of pus, and I immediately placed my hand on the tube in order to assist her in coughing any matter that might have escaped down the trachea. No further treatment was applied to the throat, but the tracheotomy wound was dressed daily.

The moral from these two cases is—never operate on the throat when there is difficulty in breathing without previously performing tracheotomy.

CASE 3.—This case was on the same farm as No. 2. A barren cow had what appeared to be a tumour deep in the neck, in the jugular furrow, a few inches from the larynx, between the trachea and the cervical vertebræ. Such was the pressure exerted by the swelling that the trachea was pressed downwards, giving to the lower aspect of the neck a distinct curve. When I first saw the cow, she was able to take nourishment fairly well, and I gave the owner a bottle of liniment to rub on with a "' wait and see " idea.

In the course of a few days I had a message saying the cow was unable to swallow anything, but that the breathing was not interfered with.

I pointed out to the owner that there was a certain amount of danger in the operation, and he said : " It is a case of operating or dying."

The cow was thrown on her right side, and whilst I was washing the seat of operation, the chloroform mask was put on. When she was got under the anæsthetic I made an incision about five inches long and dissected carefully down to what proved to be an abscess. I pressed the jugular vein upwards and the long muscle of the neck (sterno-maxillaris) downwards. When I had dissected on to the swelling, I ordered one of the men to put his hand on the opposite side of the neck and press the enlargement towards me. I inserted a trocar and canula, and when the former was withdrawn, thick pus oozed out. I used a director to guide the scalpel and made a good opening in the abscess and washed the cavity out.

I separated the muscle and tissues from the trachea and made an incision through the skin on the lower aspect of the neck opposite the operating wound, so as to ensure good drainage. The abscess cavity and the drainage wound were syringed every day. The communication between the two wounds was kept patent until the abscess cavity had completely healed. The cow eventually recovered and gave no further trouble. I may say that the amount of blood lost during the operation was quite insignificant.

General Articles.

AN INTRODUCTORY ADDRESS ON THE THIRD EYELID.*

Delivered at the Middlesex Hospital on October 15, 1919.

By Sir JOHN BLAND-SUTTON, F.R.C.S. Eng., Surgeon to the Hospital.

Mr. President and Gentlemen,—The Fates have been kind and allowed me a little leisure to take up a study that beguiled me in my early days. As a teacher of anatomy I took a keen interest in the metamorphoses of muscles, and I will attempt to tempt freshmen, some of whom may regard practical anatomy with distaste, perhaps with disgust, to study some remarkable changes in the muscles of the orbit, and though they are not mythic fancies, like the metamorphoses described by Ovid, some, at least, are as wonderful and rest on a solid foundation of fact. I want to encourage the student of human anatomy to realise that, apart from the practical value of a knowledge of human anatomy to physicians and surgeons, there is an aspect of anatomy that will lead him into some fascinating realms of speculative science. A striking example of this occurs in the muscles that move the eyelids of reptiles, birds, and beasts.

The Muscles of the Orbit.

Can anyone dissect the orbit without feeling a deep interest in the neat set of anatomical structures it contains? A little anatomical world! The study of the morphology of its muscles increases the interest. The muscles form two sets—one set moves the globe and the other the lids. Those that move the globe number six, four straight and two oblique. The straight muscles, from their position in man's orbit, are known as rectus superioris, rectus inferioris, rectus internus, and rectus externus. These, according to their position, move the eyeball upwards, downwards, inwards, and outwards. The oblique muscles produce rotatory movements, and the complex movements occurring from the combined actions of the oblique and straight muscles have led to much controversy and speculation.

The straight muscles are thin straps arising around the optic foramen, at the apex of the orbit, and are inserted into the sclerotic coat of the eye near the margin of the cornea. They form a hollow cone round the optic nerve. The oblique muscles lie outside this muscular cone. The superior oblique is sure to attract attention because it threads a neat fibrous pulley at the inner (nasal) corner of

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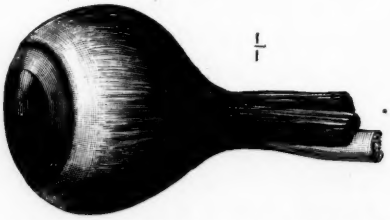
the orbit; this pulley deflects it at right angles to be inserted on the globe, towards the outer part of its periphery. The inferior oblique

FIG. 1.



Eye of sheep showing the retractor bulbi muscle.

is a short muscle arising from the floor of the orbit at a spot diagonally opposite to the pulley of the superior oblique.

A remarkable feature of the orbital muscles is their monopoly of three cranial nerves. The third cranial nerve, known as motor oculi, supplies the internal, inferior, and superior rectus, as well as the inferior oblique and the levator of the upper lid. The fourth cranial nerve, trochlearis, is monopolised by the superior oblique, and the sixth cranial nerve, abducens, goes exclusively to the external rectus.

Compared with the majority of vertebrates, man has a small number of muscles in his orbit. The six muscles just described are constant. There is in addition a long muscle to raise the upper lid. Men and monkeys possess only two eyelids, but many mammals, birds, reptiles, lizards, and amphibians possess three. The third eyelid, a very plastic membrane, anatomically and morphologically, is moved by an interesting set of muscles lodged in the orbit. The upper and lower lids are moved by a simple muscular mechanism. The upper lid, very movable in man, is raised by its special muscle, *levator palpebræ superioris*. The lower lid is not very mobile and lacks a depressor; both lids are closed by a muscle with elliptical fibres—the *orbicularis palpebrarum*, a muscle of expression, supplied by the facial nerve. In birds the lower lid is very mobile and has a well-marked depressor muscle, corresponding in shape, dimensions, and power to man's levator.

The muscle that moves the third lid may be studied in its simple condition in a horse or a sheep. When the levator and the four straight and two oblique muscles are removed a funnel-shaped muscle surrounding the optic nerve will be exposed. This is the retractor bulbi, and as it resembles a cave lodging the optic nerve it is also called the choanoid muscle.

THE RETRACTOR BULBI.

This muscle arises from the apex of the orbit in common with the straight muscles. Its origin is tendinous and narrow, but as the muscle advances along the orbit it spreads out like the gamopetalous corolla of a primrose and envelopes the optic nerve, which resembles the style; the expanded portion of the muscle is inserted into the sclerotic coat of the eye within the embrace of the four straight muscles. (Fig. 1.)

FIG. 2.

Head of shoebill. The insets show the eye in partial and complete eclipse.

It is supplied by the motor oculi. When the retractor bulbi acts it draws the eyeball into the orbit and at the same time the third eyelid, or nictitating membrane slips across the cornea. When the muscle relaxes, the membrane, being elastic, retreats and refolds itself on the nasal side of the orbit, like a folding blind or shutter. Veterinary anatomists teach that when the retractor draws the globe backwards the pressure causes the soft fat within the orbit to bulge forwards and

thus push the nictitating membrane over the eye. Whichever explanation may be offered, this at least is true : The retractor muscle is respon-

FIG. 3.

Head of turkey. The insets show the pyramidalis and quadratus ; also the termination of the tendon in the nictitating membrane. The relations of the tendon are also shown in the large figure.

sible for the movement of the membrane across the eye. When a horse is suffering from tetanus it is well known that if the eyelids be opened during a spasm the nictitating membrane will be found spread in front of the cornea.

There is no retractor bulbi in man's orbit, but on careful dissection a fibrous funnel-shaped tunic will be found lying within the embrace of the four straight muscles, intimately associated with them, and embracing the optic nerve. The anterior portion of the tunic spreads out on the posterior part of the sclerotic, repeating the method of insertion of the retractor bulbi. This tunic, or capsule, was described by the French anatomist and surgeon, Tenon, a hundred years ago ; it is named after him,Tenon's capsule. A critical examination of this capsule in the orbit of man and monkeys convinces me that it is the degenerate representative of the retractor bulbi as surely as the little pleat of mucous membrane, known as the semilunar fold, is the vestige, or remnant, of the third eyeball.

The Muscles of the Third Eyelid.

The muscular mechanism of the third eyelid or nictitating membrane of birds is easily studied in a turkey, owl, eagle, or ostrich. The membrane is neatly folded in the nasal side of the orbit and lies between the eye and its lids; it sweeps across the cornea at right angles to the eyelids. A special gland supplies fluid to facilitate its movement. It is amusing to watch the movements of this membrane, especially in big birds. In the owl and shoebill (Fig. 2) it is pearly white; the movements are very deliberate and give these birds a weird appearance. The shoebill is very grotesque with its huge bill, feathery crest, and large eyes, but when the nictitating membrane glides across the eye like a movable shade on a lamp, or more slowly producing crescent shapes resembling the phases of the moon, the varying shapes are singularly attractive and unforgettable.

The muscles that work the nictitating membrane are lodged within the orbit and attached to the globe; they can be easily dissected in big birds like rooks, owls, or turkeys. Two muscles, known as the pyramidalis and the quadratus, move the membrane. The quadratus arises from the sclerotic above the optic nerve, and its narrowest border, the one nearest the optic nerve, forms a sling. (Fig. 3.) The pyramidalis or nictitator muscle arises from the nasal side of the sclerotic and ends in a long neat tendon that plays in a loop or sling formed by the quadratus; it then winds round the convexity of the globe, under the conjunctiva, and ends in the lower angle of the nictitating membrane. In fact, the free border of this membrane may be described as the terminal expansion of the tendon of the pyramidalis. The muscular sling formed by the quadratus not only facilitates the action of the pyramidalis, but prevents contact of the tendon and the optic nerve. When the pyramidalis contracts it pulls the membrane over the eye; the membrane retracts and refolds by its own elasticity.

Crocodiles.

In the crocodile the nictitating membrane is transparent, and when the brute is under water, though the membrane is drawn across the eye, he can watch an enemy or an intended victim with advantage. Paraphrasing "Alice in Wonderland":—

Quite unconcerned he seems to lie,
Moves neither tails nor claws,
But when he winks that watchful eye
The prey is in his jaws.

In crocodiles and alligators the third eyelid is drawn across the eye by a powerful nictitator, which arises from the nasal side of the sclerotic and extends as a thick muscle half across the circumference

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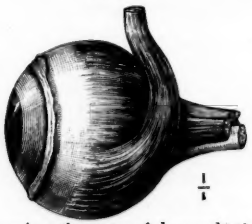
of the globe. (Fig. 4.) It ends, as usual, under the conjunctiva, in the lower corner of the third eyelid.

LIZARDS.

The muscles which move the nictitating membrane of the lizards are even more modified than those of birds. In some lizards the eyes are protected by special shields and plates developed from scales and skin. *Ablepharus*, a lizard of the Transcaspian Desert, has the lower eyelid fused with the upper ; it is transparent, and, like a window, lets in light, but excludes sand. This modification of the eyelids is of use to lizards living among sand. When the South African Force occupied Luderitzbucht (now Bothaland) in 1914, the dust of that remarkable sandy, diamond-strewn desert, blown by the prevailing wind, proved so troublesome that the eyes of the transport mules required protection by goggles.

In lizards a long slender tendon fixed to the roof of the orbit passes in the nasal fashion to the lower corner of the nictitating membrane. (Fig. 5.) At the level of the optic nerve this tendon threads a sling in the bursalis muscle, which muscle represents the retractor bulbi of mammals ; it arises from the back of the orbit, runs parallel with the optic nerve, and is inserted into the sclerotic coat of the eye.

FIG. 4.



Eye of an alligator, showing the powerful muscle that moves the third eyelid and the retractor bulbi.

When the bursalis contracts it acts on the tendon and draws the nictitating membrane across the eye. It is a rare arrangement for a muscle to be inserted into the tendon of another muscle. There is an example in man in his foot : the muscle is called accessorius.

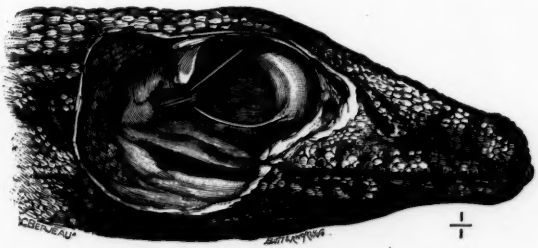
The pyramidalis is curiously modified. In crocodiles it is relatively big and muscular throughout. In birds it is one-fourth muscle and three-fourths tendon. In lizards the pyramidalis, entirely represented by a tendon, is activated by the retractor (bursalis) muscle. In sheep and many mammals the retractor works the nictitating membrane indirectly by acting on the globe. In man it is represented by a fibrous funnel that serves as the wall of a lymph-channel. In a fish, *Astroscopus*, some of the orbital muscles become electric organs.

Electric Muscles in the Orbit.

The contractile substance of muscles is structureless and enclosed in a husk, called the sarcolemma. The jelly in each muscle husk receives the terminal of a motor nerve and serves as a means for the discharge of the force developed in nerve cells. Embryologists have discovered that in spite of the differences in structure of muscle cells and nerve cells they have the same origin, but nerve cells are modified to originate impulses which are conducted by the nerves and discharged by the muscles.

Organs are not strictly adapted to one purpose ; they have a main function and subsidiary functions. Changes may gradually affect an organ and a secondary function become dominant. This happens to

Fig. 5.



The orbit of a monitor, *Varanus salvator*. The eye has been removed to show the tendon representing the pyramidalis and its relation to the nictitating membrane, and a portion of the bursalis muscle. (Museum Royal College of Surgeons.)

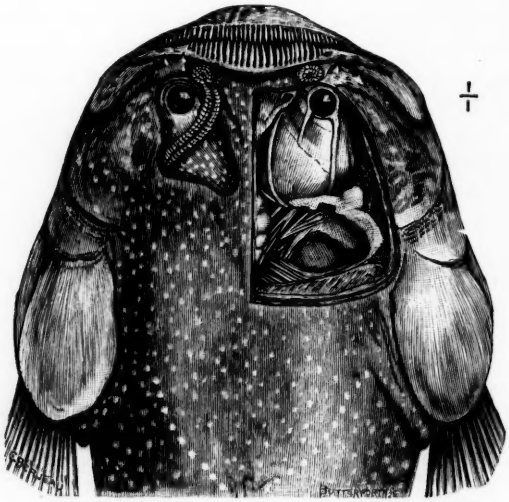
a surprising degree in some fishes, for definite tracts of muscle are so modified that the electric property predominates. In such fishes the electrical muscles, like ordinary muscles, are under voluntary control and become exhausted by use.

Electric muscles exist in several fishes—torpedo, skate, electric eel (which is not an eel), the stargazer, and the mormyr, a fish of peculiar shape living in the Nile. It was venerated by the ancient Egyptians and depicted on monuments. The proof that electric organs are modified muscles is furnished by the skate. In this fish the electric muscles lie in the tail. When the skate is young and like a big tadpole its electric organs are muscles, and Ewart succeeded in tracing the transformation of the muscle cells into electric cells.

The eyes of the stargazer are on the top of its head and the mouth is in such a position that, without knowledge of the cunning contrivance in the orbits, it would not be easy to understand how this fish secures food. Each orbit is roofed with a patch of soft skin, and this covers an electric organ. (Fig. 6.) The fish lies in the sand, and small fishes passing over it, paralysed by an electric shock, tumble into its

open mouth. In an example dissected by Dahlgren the stomach contained a number of small swiftly swimming fishes, such as young herring and mackerel. The electric organ lies in the midst of the orbital

FIG. 6.



Orbit of the Stargazer, dissected to show the electric muscle.

muscles, and receives a large branch from the third nerve and branches from the trigeminus (Sylvester).

Progress in the acquisition of reliable knowledge concerning life depends on accurate instruments. For example, the minute structure of muscle was unknown before the invention of the microscope, and the elucidation of the physics of muscular contraction required the assistance of delicate measuring apparatus. An accurate knowledge of animal heat was obtained by the use of a reliable and delicate heat measurer, the thermometer, an instrument which proved that animals have within themselves a source of heat. To-day clinical thermometers are as common in nurseries as the toy called Noah's ark. John Hunter, when he laid by experiments controlled by Ramsden's reliable thermometers the foundations of modern knowledge on this important matter, never imagined that muscles are the chief source of animal heat.

The study of the muscles concerned in the movements of the third eyelid may cause you to reflect deeply on the absorbing subject of the physiology of muscles. Such a study may lead some of you to make

discoveries in physics and neurology that will one day make the world gape with astonishment.

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THE FUTURE VETERINARY CORPS OF THE AMERICAN ARMY.

By Major C. D. McMURDO,
Veterinary Corps.

With the prospect of the adoption during the fall months of legislation for the reorganisation of the Army, it would seem wise for the veterinary profession to consider carefully some of the possibilities which this legislation may hold for veterinarians in the military establishment.

Under the provisions of the National Defence Act of June 3, 1916, the army veterinarians were given for the first time the rank of commissioned officers and the Veterinary Corps made a part of the Medical Department. It is understood that this move was with the tacit consent of the Quartermaster-General. The work of transferring the officers in their new affiliation was barely completed when the United States entered the war and no organisation had been completed. Consequently the Veterinary Corps under the Medical Department is only about two years old. With all the stress of actual warfare during this period it has, of course, been practically impossible to organise and develop the Veterinary Corps along the broad lines which could be followed in quieter days of peace. Emergencies had to be met as they arrived, leaving many questions of policy and procedure to be worked out when time should permit.

Notwithstanding these facts there has been apparent in certain quarters considerable agitation as to whether change in the affiliations of the Veterinary Corps is not advisable when Congress legislates for the new army. Several moderately well defined plans appear to have been suggested.

First.—That the veterinary service be organised and kept a separate Corps.

Second.—That it be united with the remount organisation under a common head into a new Corps.

Third.—That it become a part of the Quartermaster Corps.

Fourth.—That it remain a part of the Medical Department as at present.

In the nearly thirty years that I have been connected with the army as a veterinarian, and more particularly during the past eighteen months in which I have served in the capacity of a general veterinary inspector, I have had an opportunity to study the work of the Corps, and perhaps understand its possibilities as well, or better, than any one who remained on this side of the Atlantic, and the arguments for and against these plans present themselves to me in the following order :—

There is perhaps no more pleasant vision than that of the Veterinary Corps as an independent organisation, with its own brigadier general and staff, its own training camp and school, its enlisted personnel, and its duties clearly defined, with every member of the Corps working for the common good. However, no one who has had any experience with the military establishment believes this vision can become a reality.

Military history shows a constant repetition of the struggle for existence by the small organisation and for supremacy by the larger one. "The survival of the fittest" has been written many times over in the Army. It is doubtful whether, as a separate Corps, the veterinary organisation would last a fortnight. Perhaps a typical illustration of what is meant may be found in the history of the old Commissary Department. This Department had its birth during the Civil War, when, because of the need for greater efficiency, the Commissary was separated from the Quartermaster Department. It had its own Commissary General, and as an individual organisation it rendered excellent service. It gave its officers and men training in its particular line of work and developed a high degree of proficiency. In 1912 it was absorbed by the Quartermaster Corps (together with other staff departments), the principal argument for such absorption being that the Quartermaster Corps could, by adding one column to its books, carry on the work of the Commissary Department along with its own. No sooner was the absorption of this Department completed than its dissolution was begun. Its educational work has been discontinued, its *esprit de corps* has disappeared. Practically all that remains to-day of the Commissary Department is the crescent in red which appears upon cases containing subsistence supplies.

The possibility of the union with the remount organisation into a new Corps seems to have been the subject of discussion in the A.E.F. It is understood this plan contemplates the withdrawal of the remount branch from the Quartermaster Corps, and by union with the Veterinary Corps under a brigadier general, form a new organisation or Corps. It has been claimed that the work of the remount service and the work of the Veterinary Corps are so closely associated that they

might well be united under a common head. Except for this union at the head, it is contemplated that each organisation would function along its own particular lines.

Two points of objection to this plan present themselves.

It cannot be conceived that the Quartermaster Corps would allow the withdrawal of the remount division, and the removal of its work from the Quartermaster Corps as it exists at the present time. Quartermasters and public animals have been associated since the beginning of military history, and the present policy of the Quartermaster Corps is to extend its field of operation rather than to contract it, and it is not believed that it would look with favour upon the withdrawal of the remount service.

Although the remount service and a certain branch of the work of the Veterinary Corps are closely associated, the same is not true of all of the veterinary service as regards the animals of the army nor of that other and important branch of the veterinary service, the meat and dairy inspection. Just how this branch of the veterinary service is to be co-ordinated with the remount work is not clear.

The veterinary service is quite essential to the successful functioning of the remount service, but the reverse is not true, and a veterinary service is maintained at many points quite independently of the remount service. One unacquainted with military methods might, with excellent logic on his side, argue that rather than allow the Veterinary Corps to be made a means of enlarging the powers of the remount service, the Veterinary Corps might well be extended by assigning to it and to its officers the purchasing powers at present reposed in the Remount Service. It is, of course, unnecessary to point out that the Veterinary Corps must from the nature of things function as a professional staff corps and not as a purchasing or procurement branch.

It might appear to the casual observer that the Veterinary Corps would render the best service to the Government by being affiliated with the Quartermaster Corps, for the reason that its work lies along the same general lines. All animals purchased for the military forces are purchased by the Quartermaster Corps, but pass the joint inspection of quartermaster and veterinary officers. Public animals, while in charge of quartermaster officers, are supervised and treated by veterinary officers with a view to preventing inefficiency and relieving disability. All purchases of meat for food products for the military forces are made by quartermaster officers, but their inspection is placed under the control and supervision of the veterinary officers. Forage and grain for the public animals, purchased by the Quartermaster Corps is, or should be, inspected by veterinary officers. This

similarity of duties, has warranted the conclusion that these two Corps might well be amalgamated.

There are, however, these general reasons why such a procedure would not work to the best advantage, either of the Veterinary Corps or the military service. The inspection of animals and of meat and dairy products and of forage, should be conducted as separate and distinct from the purchase of these articles. In other words, the purchasing office should not be concerned in the determination of the quality of the supplies or animals offered. The inspecting officers should not be interested in the price paid. The accepted and published specifications are to be the sole guide in the determination of acceptable supplies or animals.

Because of the absence of professional literature, laboratory equipment and educational institutions in the Quartermaster Corps, and the well-known tendency of the layman to belittle professional training, the tendency of the Corps under such an affiliation would, it is thought, tend toward a lowering of standards, rather than a raising of them. If affiliated with the Quartermaster Corps, quartermaster officers would determine the qualifications of the veterinarians eligible for commissions. One needs but to glance over the history of the veterinary organisation at the time of the Spanish-American War, to find examples of the haphazard method by which the veterinarians were chosen for military service; at that time a number of veterinarians employed by the Quartermaster Corps were unskilled, uneducated non-graduates.

If the reader has any doubts as to the correctness of this statement, let him consult with some of the older veterinary officers in the present Corps.

As viewed by the onlooker the Quartermaster Corps is a tremendously large and constantly changing organisation. Beginning with the absorption of certain staff departments in 1912, it has during the past emergency undergone a series of transformations. Within itself there are smaller departments and branches. The Director of Finance and the Director of Traffic have been separated to a degree. The Motor Transport Corps has been an offsheet, in fact, the entire Corps may be compared to a huge maelstrom, in a continual ferment, and where the Veterinary Corps would end once it became a part of this mass, is difficult to conceive.

The principal objection to the present plan of having the Veterinary Corps under the Medical Department, may be found in the fact that the Veterinary Corps functions under the control of medical officers.

The answer to this objection is that at the present time we have not a sufficiently experienced personnel from which to draw our

administrative officers, and so long as the Veterinary Corps is a part of the Medical department it must be administered by representatives of the Surgeon General. It is confidently believed however that as the veterinary officers become better qualified in administrative duties they will be allowed a higher degree of authority and experience less and less official interference from medical officers.

Under either of the two plans outlined, however, the Veterinary Corps would operate under outside officers.

It seems then for us to choose in our own minds at least whether we will remain under the medical officers, or be placed under non-professionals.

In consideration of these two controls, it is suggested that you ask the men who had experience under both departments, whether they would prefer to work under the Quartermaster Corps, or under the Medical Department.

Remember that for more than twenty years, a large number of veterinarians in the army had been a part of the Quartermaster Corps. In that twenty years they have been granted the magnificent salary of $100.00 per month and denied the privilege of wearing the army uniform, and the veterinarians in other branches of the military establishment have attained the lofty height of donning the army uniform, drawing the pay and allowances of second lieutenents, mounted, but denied the rank.

Preventive veterinary medicine is closely allied to preventive human medicine. The two sciences proceed along parallel lines and the results of the investigations of one are frequently of valuable assistance to the other.

The work of the veterinary officers in connection with meat and dairy inspection, is essentially sanitary. The sanitation of the army is a part of the work of the Medical Corps, and by extending the training of its members, they could take over the work at present done by the Veterinary Corps. With the Veterinary Corps a part of the Medical Department, there will be no occasion for such an extension, but with the Veterinary Corps as a separate organisation, it is not difficult to imagine conditions under which such an extension might be given serious consideration. The Veterinary Corps has had limited experience in organisation and administrative work. This is through no fault of its members, but due to the lack of opportunity. To endeavour to administer its affairs with inexperienced men surely would result in disaster. Some experience to illustrate this point might be cited from the history of the Corps during the past few years.

It was only through the untiring efforts of the Surgeon General that the rank of major was restored in the Veterinary Corps. That

the leading and patriotic members of our profession, who gave up lucrative practices and comfortable homes, some even their lives, to serve their country in her hour of need, were not compelled to serve as second lieutenants, was due to the vigorous insistence of the Surgeon General, who appreciated their need of greater rank.

In my work as general veterinary inspector during the war, I have been frequently in conference with officers of the Medical Corps regarding sanitary conditions in the camps. I have invariably received the heartiest co-operation from them as well as many valuable suggestions. In several instances I have had to solicit their aid in convincing the commanding officers that suggestions made by the veterinarians were practical and necessary to the health of the command and should be carried out. Without their assistance it would have been a very much harder, if not impossible, task to have established and put in force regulations governing the thorough inspection of all meat, meat products and dairy products consumed in the various cantonments and army camps.

The Medical Corps has always stood for higher education and a strict adherence to professional ethics. Associated with them we have the benefit of their extensive libraries and laboratories, as well as their instructors. As a strong argument in favour of the Veterinary Corps remaining a part of the Medical Department, it is only necessary for the reader to compare the results accomplished by the Corps in the United States with what was accomplished across the water, where it seemed that chaos reigned, not through any fault of members of the Veterinary Corps, as they knew what should be done and tried to accomplish results, but were hampered in their efforts through being placed under the Quartermaster Corps and having a layman at their head, while in the United States, under the interested and scientific direction of the Surgeon General, they not only worked in perfect harmony but developed an organisation which secured results.

An efficient corps has been built up in the past two years. The material to work with was excellent, but it was entirely unorganised and woefully ignorant regarding military system and discipline.

In presenting these views to the veterinary profession, I have only one thought in mind, namely, that in considering this very important matter, important not only to the Veterinary Corps, but to the profession as a whole, we may decide upon a plan which will meet with the approval of the majority of the members of the profession. No plan is acceptable which has not for its basic aim, the building up of a Veterinary Corps composed of scientific veterinarians of the highest professional and personal quali-

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fications a corps second to no other and in every way a credit to its members, to the army and to the profession. We shall never be unanimous in details, but we should be united upon a general plan for the future. It is hoped that present grievances or prejudices will not be allowed to influence our decisions. Apparently the future of the Veterinary Corps promises much if we remain with the Medical Department. We shall share in the fruition of its plans. The Army Medical School will be open to veterinary officers. Its laboratories contain the veterinary section. Its training camps make provisions for its officers and enlisted men.

With the officers and men of its three Corps mingling thus intimately, in class rooms, laboratories, libraries, and camps, much will be done for the veterinary profession, in a professional, educational and social way. I believe in this direction our hope for the future lies.

Much has been accomplished under the Medical Department in the last two years. Shall we reject all that we have accomplished and start out on a new and untried venture? I sincerely hope not. I feel sure that any member of the profession giving this matter mature consideration will concur in my opinion that the Veterinary Corps will attain the best results, both for the Government and for themselves, to continue as at present in close affiliation with the Medical Corps. I will venture to predict that after the continuation of the present affiliation for a few years, the results will be so excellent and so acceptable to the veterinary profession as to have completely and for all time obliterated future attempts to bring about a change. —(*Journal of the American Veterinary Medical Association*).

MANURE DISPOSAL AS A FACTOR IN THE CONTROL OF PARASITIC DISEASES OF LIVE STOCK.*

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The results of the work on hookworm disease of man in the southern United States and elsewhere in the world has emphasised the major importance of sanitation and especially of a proper disposal of fæces as a control measure for this disease. Not only hookworms, but the other worms parasitic in the digestive tract and its adnexa in man, depend on the fæces first of all as a vehicle for their transmission. But this is equally true for the parasitic worms infesting our live stock and domesticated animals. The eggs or larvæ of stomach worms, nodular worms, ascarids, *Strongyloides*, whipworms, tapeworms, flukes and even lungworms pass first to the outer world in the manure, and a

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proper disposal of the manure is the first line of prophylactic attack.

While the importance of a proper disposal of fæces has been emphasised and is being emphasised as a control measure for such parasites of man as the hookworm, the proper disposal of manure as a control measure for a large number of important parasites of live stock has not been adequately emphasised. Yet the fact is that this point deserves special consideration. Our live stock is constantly exposed and re-exposed to parasitic infestation by virtue of the fact that these animals eat off the ground, so to speak, to a great extent. Our horses, cattle, sheep and goats graze on pastures, our hogs root up the ground in search of white grubs and hunt through swampy pig-pens for the corn which is dumped into the mud, our chickens pick most of their food off the ground or out of the soil, and even our dogs, as a rule, seem to think as much of food that has been tossed out in the back yard as of food presented in a clean utensil. This mode of feeding exposes the food of these animals to contamination, since the fæces of the animals are deposited on the ground, and the area in which the animal habitually spends its time is the area in which it feeds and which it contaminates. The prevention of this condition is for the most part impossible. The prevention of parasitic infestation as a result of this condition is a matter that calls for repeated treatment with suitable and adequate anthelmintics, thereby cutting down the supply of worms in the animals and so shutting down egg production at its source. Vigorous measures along this line may be expected to render the manure reasonably safe on the score of parasitic infestation, since parasite eggs must be produced in large numbers in order to permit of perpetuation of parasites under the operation of the laws of chance.

But while the manure deposited on the pasture is not a thing that can be readily controlled, the manure from the barns and other buildings where domesticated animals are housed is something that can be more or less controlled. Contrary to the general rule for human fæces, barnyard manure must be utilised as fertiliser, which means that it must go back to the fields somewhere. Now if the animals furnishing this manure were never on pasture and were always fed from clean troughs and racks, they would tend to lose any parasitic infestation they might have, the manure simultaneously tending to become free from parasite eggs and larvæ and safe for use on the fields anywhere so far as parasites were concerned. I have seen old horses which had been used in a large city and kept off pasture which had almost none of the strongyles of the large intestine which are so common in horses as a rule, and sheep raised under experiment conditions which were

almost free or completely free from stomach worms. But the farm animal from which barnyard manure or stable manure is obtained is usually only a transient in the barn or barnyard or stable. These animals are in the pasture every day or a part of the year, and the barnyard or stable manure is usually as infective to begin with as is that on the pasture.

There are two obvious lines of attack in disposing of the infective features of this manure. One would consist in treating the manure in such a way as to kill the parasite eggs and larvæ, and the other would consist in disregarding this feature and placing the manure where it would have little or no capacity for infecting stock.

The first method offers a field for a large amount of investigation, but this investigating has not been done. Broadly speaking, one would have to determine how long the eggs and larvæ of the various species of worms involved lived in manure piles, in spread manure, in closely packed manure ; the effect of sunlight ; the effect of moisture ; the effect of various chemicals, the chemicals in turn being of a nature not to injure the fertiliser value of the manure. There are practically no data on this and little could be surmised without such data.

The second method is one concerning which we have adequate data. It merely involves the application of facts which are fairly well known, but which have received little emphasis in this connection. We have emphasised to a certain extent the value of stock rotation on pasture as a control measure for parasites. We know that if a pasture has one kind of stock on it year after year it becomes highly infested with the eggs and larvæ of the parasites which infest that kind of stock. We might state this briefly and alliteratively as follows : *Permanent pastures perpetuate parasites.* Such pastures are dangerous —for that kind of stock. They may be quite harmless for other kinds of stock. Thus horses may safely follow swine or follow ruminants (cattle, sheep and goats) ; swine may follow horses or ruminants ; ruminants may follow horses or swine. These groups have worm parasites which in general are not transmissible to each other, so that the manure from one group is not infective for the other groups. The fact that all ruminants are infested with the deadly stomach worm makes it undesirable to attempt to rotate cattle, sheep and goats with one another.

But the extension of this idea of stock rotation to the disposal of barnyard manure and other manure has not been emphasised. I do not remember ever seeing the idea stated, yet it is probably in print. At any rate it deserves to be emphasised. Manure which is to be taken to the fields should be disposed of, wherever possible, with a view to its possibilities as a carrier of parasitic infestation. It will not always

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be possible to make the application. There are dairy farms where only cattle are kept, and the manure from these cattle must go back to the pastures and fields where the cattle graze, unless exchange is made with neighbouring farms running different kinds of stock. There are horse farms, hog farms, and sheep farms in a somewhat similar situation. In such cases one might bear in mind that well rotted manure would be safer than manure which had not been held long or rotted. The time element involved here permits of the death of eggs and larvæ as a result of various unfavourable conditions, and the rotting process may well prove lethal, since in nature the worm eggs are washed on to the pasture and the larvæ are capable of travelling, in some instances, yards away from the manure deposits. It is also likely that lime would kill larvæ when added to manure.

However, there are farms where there is an option as to the disposal of the manure of two or more kinds of stock. Horse manure may be put where horses are to run or where cattle are to run ; where such alternative offers, it is advisable to put it where cattle are to run. The same principle applies to manure of ruminants, swine and horses. Where there is a considerable amount of poultry droppings, as there sometimes is, it may be regarded as safe for anything other than birds, and manure from other animals, generally speaking, will convey no parasites to birds. On the other hand, the fæces of man and the dog are always to be regarded as dangerous. While it is true that there is little necessity for considering the disposal of quantities of dog fæces, it is also true that the casual straying over our farms by dogs maintains a persistent supply of gid in sheep, hydatids in swine, other bladderworms in sheep and cattle, and other parasitic pests. While it is true that we do not make a practice of fertilising our soil with human fæces in this country as they do in China, it is nevertheless true that the informal practice exists in this country even if there is no statement of it as a formal agricultural measure. It is well known that in the Southern States there has been, and still is over a large territory, an almost total neglect of sanitary provision for disposal of fæces in the rural districts, and something of this neglect is true for some parts of the Northern rural districts. In human fæces we not only have the source of numerous parasites of man, but the source of such parasites of our stock as " measles " (cysticercosis) in cattle and swine.

It may be urged that much of this barnyard manure is ploughed under the fields so treated sowed to crops which will be gathered and not fed back to stock. Quite true ; and that it is a safe method of avoiding infestation. On the other hand, the ploughing under of manure for forage crops cannot be regarded as assuring safety.

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SOME REMARKS ON PSEUDO-GLANDERS.

By R. Schneider.

Alterations and affections of the nasal mucosa of the horse are very frequent. Amongst them are acute chronic and catarrhal affections, pustulous stomatitis propagated to the nasal mucosa by contiguity of tissues, wounds made by the nails, hæmorrhages occurring in anasarca, etc., and it sometimes happens that benign affections are believed or suspected to be glanderous. Bearing on this conclusion Schneider describes a nasal affection occurring on several horses, and in which the first lesions were identical with those found at the start of nasal glanders. Schneider examined the horses two days later, and found the following symptoms : On one of the sick animals a little rounded and red spot in the middle region of the left nasal mucosa ; a bright red spot the size of a two-franc piece at the entrance of the right nostril ; no discharge, no glandular enlargement. The second horse showed no lesions on the left nasal mucosa. Loss of triangular epithelial substance to the extent of a five-centime piece in the interior part of the right nasal mucosa, with a little erosion covered with a dry crust in the centre, but with no tumefied edges ; neither discharge nor glandular enlargement. The third horse on examination with a nasal mirror, showed at the upper part of the left nasal wall four nodules the size of a pin-head, of straw yellow colour, with reddish borders ; no discharge and no glandular enlargement.

The general state of the three horses was satisfactory. Ophthalmo reaction with mallein gave quite a negative result. The three horses were isolated and some samples of blood sent to Berne for analysis. On October 17th the veterinarian declared a fresh case. He found a horse which presented a red spot the size of a ten-centime piece on the right nasal wall, with a yellowish nodule at the centre. The ophthalmo reaction was negative. No blood sample was taken, the blood reaction having been negative on the other three horses. On October 20th the nodules had disappeared, the red punctiform spot without thickened edges were in process of cure. The other horses presented no similar lesions. This affection, in appearance so simple and inoffensive, has a certain importance, for it is a specific affection of obscure origin—the litter being on a foundation of fresh turf. Schneider believed that this " nasal eczema " was due to mycotic infection from the litter or hay. The benign progress, the rapid cicatrisation of the nodules, as well as their non-contagiousness, allowed of the exclusion of glanders, but the ophthalmo reaction and the examination of the blood enabled shortening of the quarantine period to be effected, a very valuable thing for army horses at manœuvres or at the front.—G.M. *Swiss Veterinary Journal.*

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Review.

THE EARLY HISTORY OF VETERINARY LITERATURE AND ITS BRITISH DEVELOPMENT. Price £1 1s. Vol.—1 to 1700. London: 1919. By MAJOR-GENERAL F. SMITH, K.C.M.G., C.B. pp. 373. Publishers: Bailliere, Tindall & Cox, London.

We have here a work representing an immense amount of patient research. The author states in the preface that the collection of the material for the book occupied the best part of ten years. Even so the reader wonders how so much could be accomplished in so short a time, for no one had previously written more than short sketches of a few of the best-known veterinary writers. The author's task was therefore to produce a book of which the plan must be original and of which most of the material must be taken from the original sources. There was nothing to guide him, no second judgment to which to refer in case of difficulty.

The volume is divided into two parts, the Renascence being naturally the point of division. As culture prior to the Renascence was European rather than national. Part I is an account of veterinary science in Europe rather than in England. Each author is dealt with in strict chronological order, and foreign authors subsequent to the sixteenth century are described only in so far as they have influenced opinion in England. Chief among these foreign authors are Columbre, Grisone, Gorte, Heresbach, Ruini, the Italian lawyer of the sixteenth century, who is the father of equine anatomy, and Jacques Selleysel, the greatest veterinary writer prior to 1700. Only Michael Harward, a forgotten Englishman of Charles II's reign, can challenge this supremacy.

Interesting as are the Grecian and Roman chapters, only the English works dealt with in Part I need detain us. The first English veterinary work is the Anglo Saxon "Leechbook," or "Medicinale Anglicani" of the 10th century. It was followed by the "Herbarium" (1000-1066) and "The Medicine of Quadrupeds," then, in the middle of the 13th century, by Walter de Henley's "Husbandry," written in Norman French. The "Anonymous Husbandry," 1272-130, and early in the 14th century by "the Seneechal or Farm Steward." These works give evidence of little veterinary knowledge, but show how gladly his animals were valued by the farmer, who had evidently certain ideas of veterinary hygiene.

To the 13th century belong a number of MSS. found in the British Museum. The minute care with which they have been compared, resulting very frequently in valuable bibliographical discoveries, reflects the greatest credit on the author. The story of Harleian MS. No. 6398, called the Boke of Marshalsi, and dated about the end of the 13th century, deserves special mention. The author discovered its identity with another MS., No. 5086, with a different title, and now for the first time identified. These MSS., of themselves of great interest to students of Middle English, are important to us as showing the state of ignorance and superstition then prevalent in respect of the veterinary art, and indeed of all arts and sciences.

Part II gives full and complete notices of all the well-known veterinary writers of the 16th and 17th centuries, together with

detailed accounts of each work written by them. In addition there are shorter notices of many hitherto unknown or neglected authors, and of these only will space permit us to speak.

Chief among the unknown writers is Michael Harward, who wrote in 1673 "The Herdsman's Mate," a born surgeon, and a "pioneer in intestinal surgery." His work is epoch-making, his operations alike splendid in conception and in execution. Christopher Clifford, in "The Schools of Horsemanship" (1585) gives quite an admirable account of the hygiene of the stable and shows what can be accomplished by a man of common sense, although he lacked education.

Crawshey (1636), a sound, practical man, gave the first account of cattle practice.

Nathaniel Grew (1676) lectured before the Royal Society on the "Comparative Anatomy of the Stomach." He does not seem to know much of the horse, but his account of rumination is complete save for the nerve supply. Lower (1667-68) showed the effect of division of the phrenic nerves on respiration. He also gives the first account in English of *corpra nigra* in the horse. Sir John Hoyer (1698) (Proceedings of the Royal Society) was the first to describe the grathological changes in the lungs in "broken wind."

The veterinary art has thus been traced from its very beginnings down to its scientific establishment in England, and it is safe to say that no important work has been missed. An enormous amount of reading of original books and MSS. has been done; detailed accounts have been prepared of every important work; the exact chronological position of science may be properly estimated; most careful comparisons have been made between the various authors to determine what is original, what borrowed and from what source. In respect of the discovery and identification of the Middle English MSS., a service has been rendered to scholarship. For the sympathetic account of Michael Haward all veterinarians must be grateful. The numerous and very complete references to the original MSS. and books, and to the very few writers, English or foreign, who have preceded the author in the history of veterinary literature, are of the highest value to the interested reader, to the student and to the future historian. The style is pleasant, epithet and comment both fitting and happy, and the matter is vitalised by the writer's unflagging interest in his subject.

The book is enriched by many handsome plates of the better known authors or of frontispieces, title pages of early printed books, etc. All who are interested in the development of veterinary medicine and surgery and in the case of animals, will find this work, this study of the "rock whence we were hewn," most interesting and satisfying, and will be grateful to Sir Frederick Smith for the ten years of painstaking and conscientious labour which he has devoted to his first volume.

Personal.

Hearty congratulations to our Allied colleagues, Veterinary Major Victor Drouin, of the Veterinary Department of the Ministry of War, French Army Headquarters, on being awarded a Distinguished Service

Order, and Doctor Cavaliere, Sacco Chief Veterinary Official to the Province of Cremona, Italy, on the Order of the British Empire.

Also to the following distinguished members of the profession in our colonies or in Allied countries, who have recently been elected Honorary Associates of the Royal College of Veterinary Surgeons.

General Jean Fray, Inspecteur permanent du Service Veterinary de l'Armée Francaise.

Colonel Eugene Nicolas, Vétérinaire Principal 2e Class. de l'Armée Francaise,

Colonnello Cavaliere Olindo Bortolotti, Director of the Italian Veterinary Services.

Tenente Colonnello Guido Finzi, Director of the Military Veterinary Laboratory, Milan.

Colonel David S. White, D.V.M., Director of Veterinary Service, American Expeditionary Forces.

Colonel Clarence John Marshall, D.V.M., Director of Veterinary Services, U.S.A.

Brig. General William John Neill., Director of Veterinary Services, Overseas Military Forces of Canada.

Colonel Charles Edgar Edgett, D.S.O., Director of Veterinary Services, Overseas Military Forces of Canada.

Colonel E. A. Kendall, C.M.G., Deputy Director Veterinary Services, Australian Imperial Forces.

It is with regret that we have to record the death of Mr. R. H. Bird, of Greeley, Colorado, a well-known M.R.C.V.S. practising in the United States, and a graduate of the Dick College, Edinburgh, in 1873. His death took place in St. Anthony's Hospital, Denver, Colorado, as the result of hemorrhage at the base of the brain, caused by an injury received whilst vaccinating cattle.

NOTICES.

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